Electricity on the Farm

MONTHLY MAGAZINE FOR THE UP-TO-DATE RURAL FAMILY

JUNE, 1938

See inside back cover for front cover title contest rules.

IN THIS ISSUE

31 YEARS' SERVICE ON A WISCONSIN FARM—BELIEVE IT OR NOT—ELECTRIC STEAM BOILERS FOR THE DAIRY—WATER WORKS FOR THE FARM—A ONE-MAN HAY HOIST—ELECTRICAL HOUSEKEEPING AND MANY OTHER FEATURES

Left:
Mr. Bowman's farm is equipped with a complete wiring system

Above:
"Roomy" initial wiring eliminates expen rewiring on Mr. Bowman's farm

"I'M GLAD I HAD MY FARM WIRED THE RIGHT WAY"

says Mr. D. O. Bowman, R. D., Rockford, Michigan

"Several years ago, when I first got electricity on my farm, I nearly made a costly mistake. However, the Consumers Power Company told me how important good wiring was, and I paid a real contractor $225.00 to put in a good job, planned especially for my farm.

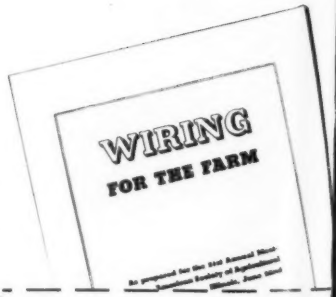
"When I see my neighbors worrying along with skimpy wiring systems — patching and rewiring — I thank my lucky stars for doing the job right. I can put new equipment in anywhere. It all operates 100% and pays me a better profit.

"My advice to any farmer is, 'Have a good contractor put in a wiring system that will serve you for years — do it right and you only have to do it once.'"

And that's sound advice, too, Mr. Bowman. Unfortunately, 70 out of every 100 farm families who have installed electricity planned only for the present. Within two years the original wiring systems proved inadequate. No further electric equipment could be added without extensive rewiring. This is the inevitable result of "skimpy" wiring.

For your own satisfaction and protection have a competent electrical contractor install an economical, but "roomy," wiring system planned for your farm. Demand "G-E Farm Wiring." It will give you a life-time of dependable service — assure you that all the power you pay for reaches your equipment.

Whether you are planning to wire your farm, or just thinking about electricity, you will want this free G-E booklet, "Wiring for the Farm." Write General Electric, Schenectady, N. Y.



General Electric Company

Dept. 6R-201, Schenectady, New York

Please send me your publication, "Wiring Farm." Bulletin 51-712.

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GENERAL ELECTRIC

FOR HEALTH AND CONVENIENCE... RUNNING WATER

Goulds CID Water Supply System for deep wells

Goulds CID Water Supply System for shallow wells

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Editor's Chat

RURAL ELECTRIFICATION is not just lines and kilowatt-hours.

Rural electrification *is* the building up of lives, homes, farms and rural communities with electricity as an aid. New inspiration! Better health! Improved products! More profits! Less drudgery! More real living! Children who like the farm!

Lines? They're just toll roads for electricity. Unused—no value. But the further you go, the more for the money.

A LESSON IN HOMELINESS

Do you ever look back? Yes. Well turn to page 10 of the April issue of ELECTRICITY ON THE FARM. Look closely at the two pictures of the same farm "living room." Here is what Miss Naomi Shank, Director of Home Service of the Virginia Electric and Power Co. writes about them: "The 'before' picture is a comfortable, liveable looking 'sitting' room, excluding the lights. In the 'after' picture, the lamp lighters have done two jobs. First, they have obtained an excellent lighting effect. Secondly they have robbed the family of the 'leisure time room' by making it an uncomfortable, stiff company 'parlor' for use only on occasional Sundays and burial days."

Look at it. She's right! Keep the knitting, the papers and the family work table. You can have good illumination with no sacrifice of homeliness.

IRRIGATION

Do you pray to keep out of trouble? Or, do you wait until you get into trouble and then pray to get out?

This is not a sermon. But every year sometime we pray for rain. Dad often remarked when I was a youngster "The Lord helps him who helps himself." Chris Wyss has helped himself in his prayers for rain. There are an increasing number of Chris Wyss's, East, West, North, and South who are finding that irrigation pays, not merely as insurance, but as a business proposition in keeping things growing with resulting better, more uniform quality of produce, higher yields, more certain markets, and that occasional Bonanza when the dry spell hits the late prayers.

You'll be irrigating some day. In the meantime here's a word of caution from one who has been "through the mill": When your crop is suffering, it is too late to hunt up an irrigating outfit. It is much easier to feed the living than to resurrect the dead.

DAWN?

Last January I hinted in my Chat that the Department of Agriculture might be asleep on the job. Some of you have asked what happened. Well, I've had two big letters from the Secretary's office attempting to set me straight—and I've sat straight and sent two back.

You'd enjoy those letters. They are longer then the ones Aunt Martha used to write, or we would print them. It would take a special edition.

I try to be fair and honest. Because I do, I'll say the editor always has the advantage in an argument, so you had better have the salt handy.

The first letter from the Department was 4½ pages single-spaced in small type and told of the many things bearing on rural electrification which had been and are being done by (?) the Department. (Let me say right here that I am a booster for the Department of Agriculture and the many, many fine things it has done for the farmers. That's why I want it to get really interested in rural electrification.) But that question mark means that I don't think the Department deserves credit for the accomplishments listed. The "doings" include some 80 research projects in 21 state agricultural experiment stations — some *good* ones, too—some additional "second-cousin" projects like the effect of the intensity and and length of light periods on the growth of plants; over 50 bulletins and circulars put out by the cooperative extension services in the different states; and reported aid from county and home demonstration

(*More on page 27*)

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A 7½-h.p. electric motor under wooden shield to protect it against solar heat on farm of Harley Earle, Whitemore, Wis. Motor was used last year for threshing 2,200 bushels of grain.

Thirty-one Year's Service ON A WISCONSIN FARM

Harley Earle Threshes 2,200 Bushels of Grain for $7.75, Fills Silos Without a Crew, Milks Cows, Saws Wood and Makes Neckyokes with Electricity . . . And That's Not All

By GEORGE H. DACY

Mr. Dacy travels and writes. He is also a Dade County, Florida, farmer; and was formerly a Virginia dairyman.

HARLEY EARLE is listed as one of the "thinkingest" farmers along electrical lines in the State of Wisconsin. If there's a new or better way of using a motor to lighten labor, you'll find Mr. Earle among the first to test it out. He also keeps accurate cost accounts of his diversified uses of high line service.

Threshing was just over when I stopped last summer for a half-day visit with Mr. Earle. Twenty-two hundred bushels of oats and barley had been threshed and elevated to bin storage by electricity. A 7½-horsepower portable motor operates the separator; a 3-horsepower motor runs the stacker fan. In order to get away from the buildings a 220-foot extension cable is used. It is plenty hot in southern Wisconsin during June and July so a sun shield is used over the larger motor.

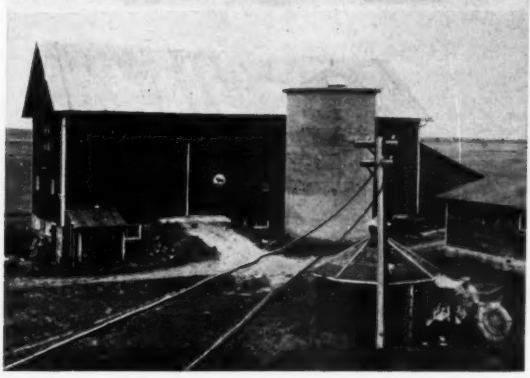
A 1-horsepower motor does the job of elevating the grain to bins in the mow of the barn. Mr. Earle's father-in-law, 68 years old, handles the grain wagon without extra help. The grain is delivered directly from separator to wagon. One wagon is in transit from field to barn while a second is being loaded. The motor located below the grain bins elevates oats and barley at the rate of 11 bushels a minute.

A crew of five men and a boy with the aid of electric power threshed the 2,200 bushels of grain in 4½ days. The oats yielded from 72 to 85 bushels per acre; a mixture of oats and barley, 54 bushels. The Earle practice is to plant a combination crop of oats and barley which is ready for grinding as delivered from the thresher.

The total cost of electric power for operating the trio of motors used in threshing was $7.75. The total daily consumption of electricity amounted to 60 kwh.

Silo Filled for $1.50

The larger portable motor also provides power for running the 13-inch ensilage cutter. The 14- by 34-foot silo is filled with the aid of but one hired helper. Three workers fill the silo to capacity in 4 working days at a total cost for electric power of $1.50. The ensilage cutter is never run at a



Upper: Mr. Earle used this 7½ H.P. portable motor in threshing, silo filling and grinding feed in a hammer mill. **Center left:** Light for illuminating the yard. **Center right:** This lamp and reflector give spot illumination at the barn and milkhouse door shown in the lower picture. **Lower:** A look down the electric lines at Earles, showing brooder house, dairy barn, dairy, silo and sheep house.

speed greater than 500 rpm. Ordinarily 75 big loads of corn are required to fill the silo.

A scaffold directly above the driveway inside the barn has a capacity of one ton of bulk hay. This is made to hold 3 tons by the simple expedient of running the alfalfa through the ensilage cutter. The cut alfalfa is stored on the platform until winter when it is converted into meal by running it through the hammer mill, driven by the large motor. The alfalfa meal is fed in a mixed ration to pigs and chickens. Mr. Earle told me it cost one cent per hundred pounds to grind alfalfa using a 3/16-inch screen which delivers about one bushel of ground feed a minute. Tests which he has made have indicated this fineness of alfalfa meal is best for hog feeding. In making chicken mash, a 1/8-inch screen is preferable; it costs about 5 cents for electricity to grind 100 pounds of this chicken meal.

The Earle herd consists of 15 high-grade Holstein cows which are milked twice daily with two double unit milking machines operated by a 1/3-horsepower motor on a 220-volt line. The original 110-volt line did not supply sufficient current to operate the machines effectively so Mr. Earle installed an additional wire and doubled the voltage with eminently satisfactory results.

Workshop Electrified

The workshop on the Earle farm is what you might expect on a place where electricity has been in use for 31 years. A line shaft extends underneath the homebuilt work bench, from which is operated a power saw, grindstone, and a homemade turning lathe. During spare time Mr. Earle made the lathe from iron salvaged from discarded farm equipment. I noticed a 42-inch neck-yoke in one corner of the shop. It was made from a piece of oak grown on the farm. "I turned it out in about an hour," was Mr. Earle's comment, "and it was quite a saving over what one would cost at the store."

A cement mixer of one wheelbarrow capacity attracted my attention in the machinery shed. It was designed for operation with a gasoline engine, but the engine had been replaced by a 1/4-horsepower motor mounted on the same base as the mixer. The owner runs this rig for half a day at a time on a single kw-hr of current.

A 3-horsepower portable motor is used both for sawing wood and shelling corn. Wood sawing, an odd time job, gets attention when other work is slack. The power saw is used advantageously in reducing rubbish such as is wont to acumulate around the average farm into fuel. Corn is shelled as needed; it costs about one cent for current to shell 20 bushels of corn with the old 2-hole sheller.

Baby chicks are raised in an electric brooder of the hover type. In February and March of last year 215 chicks were brooded during 6 weeks of cold weather which ranged as low as 8 degrees F. All except 8 of the chicks were raised successfully, 170 kw-hrs of current cosing $3.75 being used.

The Earle home is as replete in electrical equipment as the farm. An electric refrigerator, new electric range, ironer, washing machine, waffle iron, toaster, radio, griddle, sewing machine, and vacuum cleaner help to lessen Althea Earle's labors in her comfortable modern home.

Despite his ten farm motors and the many household appliances, Mr. Earle is not through. He likes the returns from using electrical equipment so well that he is still expecting to buy more.

One of the beautiful native grass valleys of Tillamook County, Oregon, where irrigation is earning 10–12¢ per pound of butterfat produced.

Believe it or not

Chris Wyss Is Making an Extra 10¢ per Pound of Butterfat by Irrigating Pastures with an Electric Pump in a County Having 96 Inches of Rainfall per Year

By C. B. GREENOUGH

Mr. Greenough Is Agricultural Engineer for the Mountain States Power Co., Albany, Ore.

THERE are few, if any areas in the United States that have as much rainfall as Tillamook County, Oregon, and at the same time are making a good profit from irrigation. "Believe it or not," with 96 inches of rain in a year, irrigation has a very important place in profitable farming in this county.

Tillamook, located on the coast in the northeastern part of the State, is a natural grass country. Climatic conditions are not suitable for the growing of grain, and milk production is dependent almost entirely on grass pastures. Substitute feeds must be added during a portion of the summer as there is less than 3 inches of rainfall in June, July and August. These shipped-in prepared feeds and succulent crops such as stock beets increase production costs. With the reduction of the cost of producing milk in mind, the Oregon State College Extension Service and the Mountain States Power Company cooperated with an interested dairyman in installing a 5 h.p. sprinkler irrigation system in the late summer of 1933. Fifteen acres of Ladino clover were irrigated. The increased yield saved over $400 on supplemental feeds that season. This first irrigation system stirred up producers. They wondered about the irrigation of native pasture grasses. Irrigating grasses with a sprinkler system and pumped water was a bold step in a country with 96 inches of rainfall. Many trials since 1933 have proved that it is a profitable practice.

Starting with one sprinkler irrigation system in 1933 the number in Tillamook County has increased to 30 in 1937 with 550 acres of native grasses and Ladino clover being watered. About 60 per cent of these systems are electrified. The balance have natural pressure or use gasoline engines.

Typical centrifugal pump direct-connected to a 5-hp. motor for sprinkler irrigation. This one is on the Chris Wyss farm.

Possibly the most convincing proof one could have is taken from Mr. Chris Wyss' irrigation operations for 1936-37. Mr. Wyss kept accurate records of his costs and results. His investment for irrigation equipment, including pipe, sprinkler

(*More on page* 33)

DETERMINATION! —that's the thing!

"Speaking of Home Water Systems, I Have One; and the Cost Is So Low While the Returns Are So High, You Can Have One, Too."

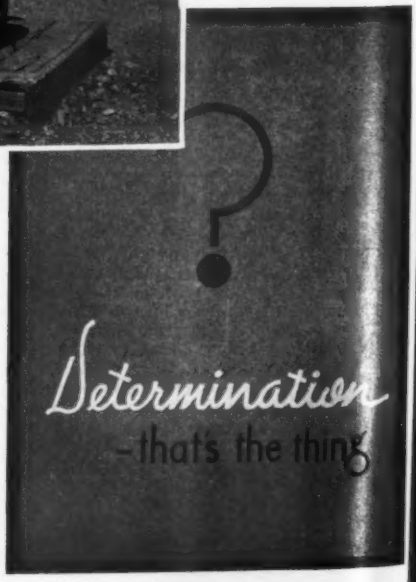
By CAROLINE S. COLEMAN

Mrs. Coleman lives on a cotton farm at the edge of the village of Fountain Inn, S. C. She's Scotch-Irish. Three generations of her ancestresses carried water from the same spring. She writes some as a hobby—but that's secondary to being a mother to her three daughters and two sons.

OUR pioneer mothers cheerfully endured hardships in the establishing of their little homes in the wilderness. They were looking forward to a distant day when this land they loved and helped to win would be a region of comfortable homes and rich farmsteads where generations that came after them should enjoy the fruits of their toil.

To and from the spring at the foot of the hill went the pioneer housewife bearing great "biggins" of fresh water for cooking, washing her cherished household utensils and scrubbing the rude plank floors of her cabin in the clearing. When her "man" became progressive enough to dig a well in the back yard, she was quite fortunate, indeed. Soon she was wondering how she ever held out to carry all that weight of water up hill. "And, dearie, do you know the well scarcely cost a thing but labor? It was just the determination to have it; that was the thing, and not money," said one of the great-great grandmothers who was envied by her neighbors as the possessor of a well—"a modern convenience."

Nearly a hundred years since grandmother got her well, and was liberated from that trip to the spring; yet today many of her descendants are still winding water from the well just as she did a century ago. "What was good enough for my great-great grandma is good enough for my wife and daughters," is the apparent attitude of many rural husbands today. And still they wonder why women are not satisfied on the farm, and grumble about "the world going to the dogs" if the young people begin to compare their home with



that of their city cousins and to "wonder if city life isn't the happiest, because at Cousin Ella's you feel so fresh and clean after a bath in her shining tub which doesn't have to be carried out into the back yard to be emptied."

The average modern (?) farmer need not laugh and joke at the expense of "Grandpa who was so long about getting around to digging a well." Grandpa didn't wait a century, even if he did say, "Well, why you don't want to carry water from the spring is more than than I know. Let city folks have their wells if they want to. A good cool spring with plenty of clear running water is the thing for the country."

We modern housewives have had our troubles with the descendants of "Grandpa" who have put us off all these years when we claimed it as our right to have a system of home waterworks, equally as convenient as that of Cousin Ella in the city. Now the time has come when strikes are in order, and we should rise and demand our rights. We have pioneered long enough.

And, speaking of home systems, I have one, and the cost is so low, while the returns are so high that you can have one, too. "It was just the determination to have it, that was the big thing—and not the money," as great-great grandmother said when she got her well. We have electricity in our home, and we have a good well of abundant pure water. It was such a simple thing to attach an electric pump. To me no music is sweeter than the purring of that pump. It means water on tap for my shining kitchen sink. Water through pipes to barn, wash place and chicken runs. Water to my tiny bathroom, which was built with little cost by enclosing one end of a porch. Hot water is supplied by a galvanized tank, heated by a coil in the kitchen range. Sewerage as satisfactory, and as sanitary in disposal as in the home of Cousin Ella, is taken care of by a metal septic tank a little way from the house. The tank is buried underground, and radiating from it is a series of hollow tile pipes embedded in cinders which absorb the wastes. The entire cost of the system, including building the bathroom, fixtures and everything was around $300. And the cost of operating is only a few cents added to our monthly light bill. Up-keep including repairs and oil for lubricating the motor is very little. Shades of great-great grandmother with her "biggins" and her "man" with his contempt for "Women's foolish ideas of always wanting something"! You can have "modern conveniences, too," and you don't have to move to the city to get them.

—Pa stood I am a farmer—

Belt Drive; Lagging Pulleys

By HARRY L. GARVER

Mr. Garver is rural electrification investigator, Washington State College, Pullman, Wash.

THE USE of electric motors with machines formerly driven by gas engines may call for changes in pulley sizes. Motors usually run faster than gasoline engines. The first thing to remember is that increasing the size of the driving pulley, that is, the pulley on the motor, will increase the speed of the belt and turn the driven pulley faster. Decreasing the size of the pulley on the motor will effect the opposite change. Increasing the size of the driven pulley will cut down on the number of revolutions per minute of the machine, while decreasing the size of the driven pulley will increase the speed of the machine. These statements are fundamental and must be followed in figuring pulley combinations.

To figure the diameter of pulley needed to produce a given speed:

$$\text{DIAMETER} = \frac{\text{diameter} \times \text{rpm}}{\text{RPM}}$$

or

$$\text{diameter} = \frac{\text{DIAMETER} \times \text{RPM}}{\text{rpm}}$$

in which the capital letters refer to the motor or driving pulley and the small letters to the machine or driven pulley.

Example: Suppose a motor has a full load speed of 1750 revolutions per minute (taken from nameplate) and is equipped with a 7 in. diameter pulley, and we desire to drive a small hammer mill at 3000 revolutions per minute, what size pulley will be required on the hammer mill? Substitute the values given for the letters in the formula:

$$d = \frac{D \times RPM}{rpm} = \frac{7 \times 1750}{3000} = 4.08$$

The diameter of the pulley on the mill should be 4.08 in., or approximately 4 in. To be accurate in these calculations the thickness of the belt should be added to the diameter of each pulley.

There will always be a certain amount of slippage between the belt and the pulley surface. So the machine would run perhaps 5 per cent slower than the computed speed. This will vary according to the load, the tightness of the belt and the condition of the belt and pulley. A smooth pulley will give better results than a rough pulley. In using a leather belt, put the smooth, or hair side, next the pulley.

It frequently happens that pulleys at hand are just a little too small to give a desired speed. Inasmuch as the speed of the motor is fixed, sometimes it may be desireable to change a pulley size.

A few years ago I saw a main pulley on the cylinder shaft of a threshing machine lagged with canvas to increase its size. The canvas was impregnated with water glass such as is used to preserve eggs but without dilution. In this case the canvas was riveted to the pulley, but in making several trials, it was found not to be necessary

(*More on page* 33)

ELECTRIC STEAM BOILERS FOR THE FARM

Electricity Replaces Fuel for Producing Steam in Oregon Dairies; It Also Supplies Hot Water from the Same Boiler

By BEN W. FABER

Mr. Faber, a westerner with eastern experience with a large electrical manufacturer, is now in the Rural Service Department of the Portland General Electric Co. at Hillsboro, Oregon.

"IS STEAM made with electricity really hot?"

A milk inspector asked that question at a state fair where an electric steam boiler was on display for the first time. The boiler was "steamed up." The milk inspector didn't wait for a reply, but put his hand over the steam jet and turned the valve. He found out—and carried away convincing proof in a badly burned hand.

Just west of Portland, Oregon, lies the fertile Tualatin Valley. There are six electric steam boilers in operation in the valley. Five are 30-gallon capacity and one is a 60-gallon.

The first boiler was installed in August, 1934 at the Guernsey Dairy near Hillsboro, owned and operated by Mrs. H. V. Couch. This is a Grade A retail dairy. The boiler has been in continuous operation for nearly four years. The only maintenance expense has been a few steam gaskets. The boiler is automatic in operation except for filling with water once a day. The pressure switch can be set to give steam pressures up to 100 pounds. All bottles and utensils are washed and sterilized with hot water and steam from the boiler.

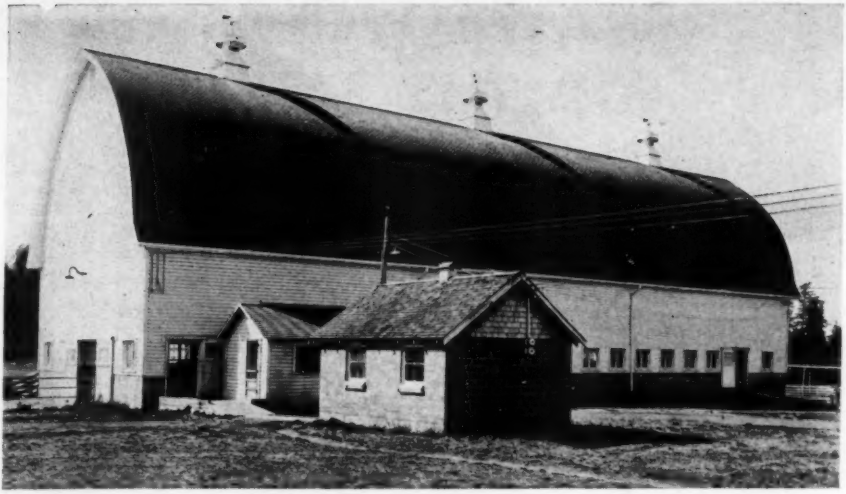
Before the electric boiler was installed, a Diesel burner was used. Mrs. Couch who is now an enthusiastic booster for the electric boiler has this to say about it. "It's fool-proof, and where we use so much hired help, that's important. It is always ready with hot water and steam. It saves time over the Diesel and costs very little more to operate. The greater operating cost is readily offset by convenience, cleanliness, safety, and freedom from odor."

Between 25 and 30 cows are milked at the Guernsey Dairy. Electricity not only runs the steam boiler but also helps with the milking. Then too, there is the 5-horsepower electric irrigation pump, which waters the 9 acres of Ladino clover for pasture, and 15 acres of alfalfa for hay. On this small farm of 45 acres, over 2/3 of their hay is raised right there on the farm.

The accompanying photograph shows one of

Upper: Pauline frequently operates this boiler on the W. E. Blatter milk goat farm.

Lower: Boiler and washing equipment at the Guernsey Dairy of Mrs. H. V. Couch. This and the Blatter boiler are each of 30 gallons capacity.



The up-to-date dairy of Hagg & Sons where hot water and steam are produced by electricity. No fuel, fire hazard, smoke or ashes.

these boilers in operation at the W. E. Blatter farm, where from 40 to 50 goats are milked to supply Portland with goat milk. This boiler has been in operation since June, 1935. It replaced a wood-fired boiler which was a fire hazard besides being dirty and expensive to operate. The electric boiler uses from 20 to 25 kilowatt hours a day. It also supplies warm drinking water for the goats.

The Blatter Dairy is a family affair. Frequently, Miss Pauline Blatter does the work at the dairy. Pauline says, "Of course I can run the electric boiler; and I can do it better than Edwin" (her brother).

The largest electric boiler in the county is that of Julius Christenson & Sons. They milk from 90 to 100 cows and the boiler is always ready with lots of hot water and steam. One of the main reasons this electric boiler found a home at Christenson's was due to its safety from fire. Two barns have been burned at this farm, and the Christenson's believe in playing safe.

* * *

The Electro-steam boiler is really a glorified electrified water heater. It is made especially strong to stand steam pressure, has a water glass, steam pressure gage, safety blow-off valve, an automatic pressure control, and an extra heavy covering of insulating material. It should rightly be called a steam accumulator instead of a boiler. It uses a relatively low wattage heating element, —much smaller than regular steam boilers—which continues to heat the water through the night until the pressure in the tank gets to a predetermined point. The automatic switch turns the electricity off and on holding the pressure at that point until the steam is used. What you have is a tank full of super-heated water (possibly 316 degreesF. corresponding to 70 pounds pressure) which flashes into steam as soon as the outlet valve is opened. Water for washing utensils is drawn from the bottom of the boiler. This reduces the boiler pressure only slightly, and steam may be drawn from the top for sterilization. Presto! A low wattage, large capacity accumulator. This equipment was described on page 6 of the August 1933 issue of ELECTRICITY ON THE FARM.

—THE EDITOR.

—I'm proud I am a farmer—

Electricity an Extravagance?

OUR dairy and stock barns were the first in our community to be lighted by electricity. Then we added running water all through the barns by means of an electric pump. Some of the folks about us thought we were wild and very extravagant. It was just two days after the electric pump was put in operation that our barn caught fire from a pesky oil heater used to heat water for washing milk utensils. We had the four concrete troughs in the barns filled with water, and by keeping the pump running and forming a bucket brigade we saved the barn and an investment of several thousand dollars. We have a hose and pipe connections now which would have saved the bucket brigade.

That was lesson enough for us, so we got that pesky oil stove off the farm and installed an electric water heater for sterilizing the milk utensils.

Then we installed a milk cooler. Folks who criticized us continued to buy ice and to pay a lot more for it than we did for electricity. We never could get the results with ice that we get with the electric cooler. We meet all of the requirements of the city milk inspection bureau and have not found in the ten years that we have had electricity that we have been either wild or extravagant.

Mrs. N. N. Dryden, Eagleville, Tenn.

WATER WORKS FOR THE FARM

Article II

By HERBERT C. ANGSTER
Secretary, Electric Water Systems Council

THREE factors have to be considered in the selection of a pump:

1. Suction conditions. These conditions determine whether a shallow well or deep well type of pump is to be used and where the pump is to be located.

2. Water requirements which determine the size of the pump.

3. Discharge conditions which determine the class of pump to be used, that is, whether low, medium, or high pressure.

In the preceding article in this series we discussed suction conditions and water requirements. This article will be concerned chiefly with discharge conditions and points to keep in mind in the selection of a pump.

Shallow well systems, as explained in the previous article, are used in drawing water from a cistern, spring, lake, stream or other source of supply where the vertical suction lift is 22 to 25 feet or less.

Classes of Shallow Well Pumps

Shallow well pumps may be classified into three groups as follows:

1. Low pressure group for 43 pounds maximum pressure or 100 foot lift.

2. Medium pressure group for 100 pounds maximum pressure or 231 foot lift.

3. High pressure group for 350 pounds maximum pressure or 800 foot lift.

After the discharge conditions are known, every shallow well installation will fall into one of these groups depending on the discharge lift or the pressure required.

Most pumps sold are in the low pressure group. It has, therefore, been possible for manufacturers to standardize on certain sizes of pump units in the low pressure group. Each size has one capacity rating, one standard size of motor, and the pump is operated at one standard speed.

Several manufacturers, for instance, have three sizes of pumps in the low pressure group:

250 gallons per hour equipped with 1-6 HP motor
350 gallons per hour equipped with 1-4 HP motor
500 gallons per hour equipped with 1-3 HP motor

The pumps in this group are designed around the motor to get, in each case maximum capacity against 43 pounds discharge pressure with the size motor used.

There is a lower sales volume in the medium pressure group. Standardization is carried out as far as possible. For instance, by changing the operating speeds, manufacturers are able to vary the capacity. By changing the motor size, they are able to fit the pump to meet various pressure conditions.

In the high pressure group, the same practice is followed, that is, operating speeds and motor sizes are changed to meet varying conditions of capacity and pressure.

Before examining certain typical installation problems in connection with shallow well systems, a brief explanation of the total suction lift is advisable. The total suction lift includes not only the vertical distance from the source of supply to the pump but in addition, the loss caused by frictional resistance to the water flowing through the pipe. This friction loss is easily determined by referring to the tabulation giving the friction loss in feet for any given size of pipe and volume of water, published in the March issue of ELECTRICITY ON THE FARM. A safe rule to follow is never to have the pipe lines smaller than the suction or discharge tappings on the pump. It is sometimes advisable to have them slightly larger.

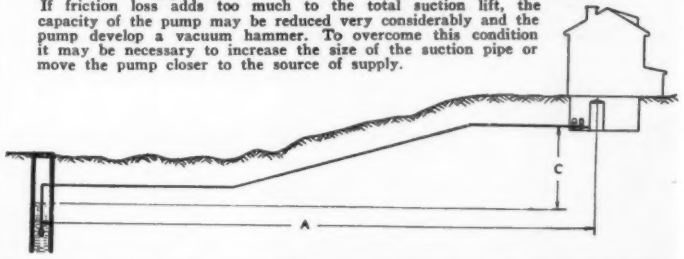
The three diagrams shown illustrate three general methods of installing shallow well pumps.

In the deep well line, it is common practice, because of the changeable cylinders, to build the pump heads for certain standard strokes and to operate in each case at a fixed speed and to vary the capactiy as required by changing the size of the cylinder.

Varying head or pressure requirements are met by changing the size of the motor.

Shallow Well System—Pump and Tank at Point of Discharge

This installation is satisfactory where the vertical suction lift (C) plus friction loss in suction pipe does not exceed 25 feet. Consult friction loss tables. If friction loss adds too much to the total suction lift, the capacity of the pump may be reduced very considerably and the pump develop a vacuum hammer. To overcome this condition it may be necessary to increase the size of the suction pipe or move the pump closer to the source of supply.



In the selection of a deep well water system, it is necessary to consider the following:

1. Static level of water in the well. In nearly all wells the water rises higher than the point where it enters the well. This high water level is known as the static water level and usually cannot be taken as the working level from which the pump will draw water.

2. Drawdown. When the water is removed from the well by continuous pumping the water level lowers. As the water is drawn down, the capacity of the well is generally increased until a point is reached where the maximum flow is obtained. The distance from static water level to the low water level or point of maximum capacity is known as the "drawdown."

3. The cylinder should be placed below the water level so that it will always be submerged even though the water should draw down to the level of maximum well capacity. Care should be taken however, to keep the cylinder a sufficient distance from the bottom of the well to prevent pumping sand. When a cylinder is installed as above, it is not necessary to use a "tail pipe" or suction pipe below the cylinder.

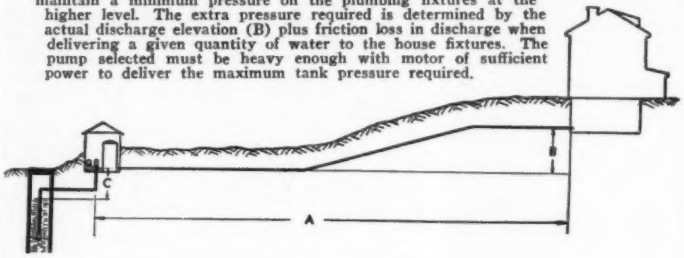
4. Diameter of well casing. The size of the well casing must be considered when selecting the cylinder and drop pipe to be used, for it must be large enough to give ample clearance between the outside diameter of cylinder and pipe couplings and the inside diameter of the casing.

5. Size and type of cylinder. After estimating the water requirements, the size of cylinder to use may be determined by multiplying the capacity of the cylinder per stroke by the number of strokes made by the pumping head per minute. Reference to your manufacturer's catalog is recommended for detailed data on this subject. Some allowance should be made for slippage (leakage past piston) when pumping against high discharge heads.

Check the maximum outside diameter of the cylinder and pipe couplings and compare with the inside diameter of the well casing. The cylinder and pipe couplings should be at least ¼" to ½" smaller in outside diameter than the casing to give ample water clearance between the two.

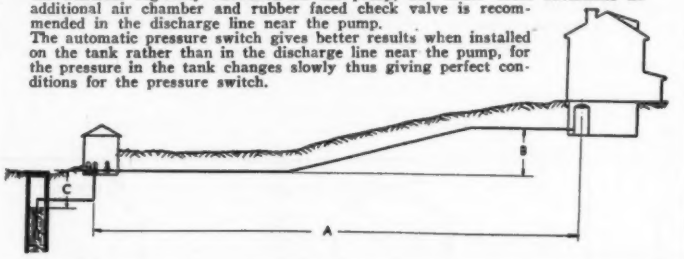
Shallow Well System—Pump and Tank at Source of Supply

With this type of installation no trouble should be encountered on the suction side of the pump provided the **total suction lift** does not exceed 25 feet. However, a long discharge line from pump and tank to point of delivery may set up pipe friction losses sufficient to reduce the flow of water. Careful consideration must also be given to vertical discharge elevation.
Pressure in the tank must be greater than at point of discharge in order to force a given amount of water per minute through the discharge pipe and maintain a minimum pressure on the plumbing fixtures at the higher level. The extra pressure required is determined by the actual discharge elevation (B) plus friction loss in discharge when delivering a given quantity of water to the house fixtures. The pump selected must be heavy enough with motor of sufficient power to deliver the maximum tank pressure required.



Shallow Well System—Pump at Source of Supply, Tank at Point of Discharge

With this type installation the pump will be operating under higher pressure than will be shown on the pressure gauge in the tank. This extra pressure is equal to the vertical distance (B) plus friction loss in discharge pipe from pump to tank. Furthermore, pulsations in the pump discharge may cause a momentary excess pressure at each stroke. These pulsations are partly absorbed by the air chamber regularly furnished on the pump, but under these conditions an additional air chamber and rubber faced check valve is recommended in the discharge line near the pump.
The automatic pressure switch gives better results when installed on the tank rather than in the discharge line near the pump, for the pressure in the tank changes slowly thus giving perfect conditions for the pressure switch.



Open Top Cylinder Recommended

For best installation the open top or artesian type of cylinder (or working barrel) is recommended. In this type of cylinder the inside diameter is smaller than the inside of the drop pipe connecting the cylinder to the pumping head above. This permits easy installation and later removal of the plunger and lower valve through the drop pipe without disturbing any pipe connections. If it is found that a cylinder meeting the requirements as outlined is too large in outside diameter to go in the well casing, it may be advisable to use a double acting cylinder or use what is known as the flush cap type of cylinder with smaller maximum outside diameter. This flush cap cylinder requires a smaller size drop pipe through which the plunger cannot be withdrawn.

To get the maximum amount of water from a given size casing it is sometimes advisable to use a double acting cylinder.

6. Horsepower requirements. In estimating the horsepower of deep well pumps, is is necessary to determine the total head which includes:

(a) The lift in well from low water level to surface of ground.

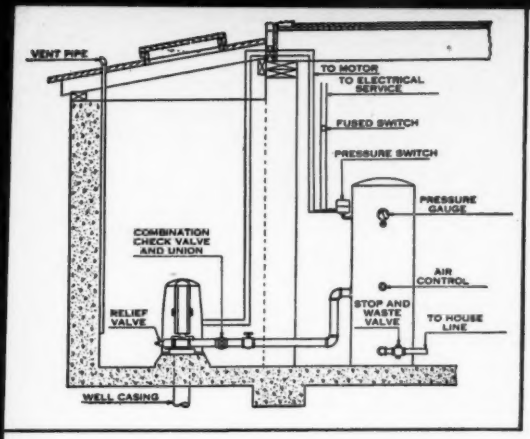


Diagram 1-A

(b) Either discharge elevation from pumping head to point of discharge or hydropneumatic tank pressure or both.

(c) Friction loss in discharge pipe.

When total head and capacity are determined the horsepower required is easily determined from tables in pump manufacturer's catalogs.

Probably the most satisfactory installation of a deep well water system is with the well located just outside the foundation wall of the house, so that the pump room really becomes a part of the basement, giving easy access to the pumping head, tank and all controls in any kind of weather. This type of installation is shown in diagram No. 1 and detailed view No. 1-A. Note that the plunger rod can easily be pulled up through the manhole for renewal of the cylinder crimps or cup leathers, inspection of valves, etc.

Often the well is somewhat removed from the house or point of discharge as in diagram No. 2, making it impossible to build a pump room on the basement level. Under such conditions a well ventilated frost proof pit may be arranged to set the pumping head and motor below frost level. A horizontal type of tank may be buried in the ground with only the end extending into the pit for attaching gauges, controls, etc., thus saving space. Vertical tanks can be located in the pit or in the basement at the house, but in the latter, an air chamber and check valve is recommended in the discharge line near the pump to reduce pulsation and excessive pressure on the upstroke with consequent loss of power and possible motor trouble.

Where it is not possible to have a well conveniently located at the house nor to provide a waterproof pit below the frost line, the method shown in diagram No. 3 should be used. In such an installation a frost proof set-length may be attached to the pump which puts the discharge head and piping below the frost level. Pressure tank may be located in the basement of the house and an air chamber and rubber faced check valve placed in the discharge line near the pump.

Operating Costs Low

A modern water system with its automatic features provides for domestic, commercial and industrial fields, a water supply that is dependable as that received from any large municipal water plant. By actual comparison, the cost of operating a private plant of this kind will usually be found less expensive than the purchase of such service from a large public water supply system.

Shallow well systems drawing water from a well, cistern or other source of supply with a vertical suction lift of not more than 22 to 25 feet, usually require about one kilowatt-hour per 1000 gallons of water delivered under pressure. Deep well systems (up to 100 feet) rarely require more than one and one-half kilowatt-hours of electricity per 1000 gallons of water delivered under pressure.

The power used or cost of pumping water is not dependent on the size of motor but rather on the number of gallons delivered and the lifts and pressures involved. The larger capacity system with a larger motor requires more electricity while in operation, but the actual amount delivered should cost per gallon about the same as it would with a smaller pump and motor.

Sales of electric pumps in 1937 increased 147 per cent over 1934. Of importance in this increase is the fact that prices today are the lowest in the history of the industry. Increased production and improved design have enabled the manufacturer, for instance, to sell at $67 retail a 250-gallon system that 12 years ago sold for $125.

The purchaser should not make the mistake of buying a pump too small for the job. There are on the market pumps of smaller capacity and lighter construction. Such units equipped with small tanks are serviceable for light work such as very small

(*More on page 26*)

Diagram 1

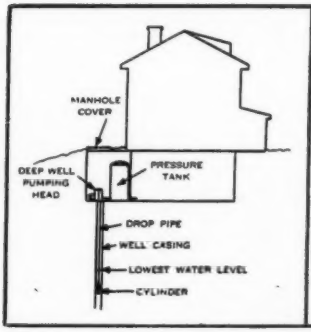


Diagram 2

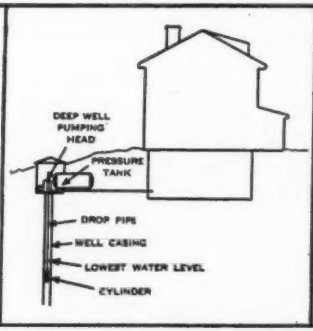
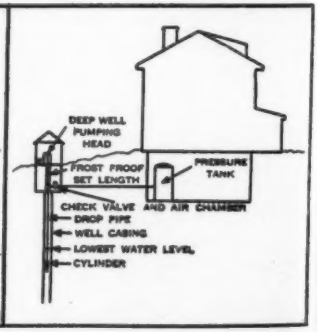


Diagram 3



A ONE-MAN LOW-COST HAY HOIST

A Labor Saving, Horse Saving, Boy Entrancing Piece of Equipment When Properly Selected and Installed

By WALLACE GEORGE

A HAY HOIST, like some other things—kitchen mixers and diapers, for instance—must be properly placed and installed if they are to be effective and satisfying.

Ten years ago Prof. E. L. Potter, Ben Rodenwald, Al Oliver and some others out at Oregon State College did some experimenting and worked out a system for hoisting hay into a farm barn with an electric motor which, in my opinion, is still the best system which has been devised. The outstanding feature of the arrangement is that the man on the load of hay does the whole job and he is in complete control of the hoisting operation at all times. Instead of having the old harpoon fork come flying back at him as if the devil was after him, the operator can ease the fork down with one hand, untwist the rope, pull the fork over in position to stick, and then drop it. That's labor saving!

The machinery part of the arrangement consists of a motor and one of the simplest single drum hoists you can buy. A hoist drum 8 inches in diameter or larger is preferable. It is easier on the rope. The essential thing, however, is a single lever control. This lever, when raised to mid-position releases the brake and clutch so the drum is free to turn. That is the pull back position. When the lever is raised, the clutch is thrown in for hoisting; when it is dropped the clutch is thrown out and a spring or weight automatically applies the brake. Such hoists are on the market; and if farm equipment manufacturers were wise to themselves, more of them would come to that style.

The motor for operating the hoist may be anything from one horsepower up. One horsepower is a little small. Three is about right. Five horsepower, or anything you may have up to 20 horsepower will work fine. You should bear in mind that a 10 horsepower motor doing a 3 horsepower job uses only three horsepower of electricity, so there is little loss. It isn't like feeding horses. The amount of power required depends on the speed of hoisting. If you are satisfied to have your load go up slowly, you can get along with a smaller motor. Since the actual hoisting takes only about one-fifth of the total unloading time, a slow hoisting speed is not a serious disadvantage, and it is easier on equipment.

If your motor has a magnetic starting switch

The man on the load controls the entire operation. One rope controls the hoisting, stopping and pull-back. The other is the trip rope.

ELECTRIC HOIST OPERATION*

The Track Was 45 Ft. from the Ground and the Hay Was Moved Back in the Barn from 30 to 100 Ft.

Fork	Fork lifts per load	Weight per lift	Unloading time per ton	Fork setting time	Hoisting time	Getting ready to pull back	Pull back time
		lbs.	*minutes*	*seconds*	*seconds*	*seconds*	*seconds*
4 ft. Jackson.....	8.0	282	18.11	80.0	28.0	14.0	32.0
Grapple	7.0	318	17.00	64.0	28.0	11.0	42.6
Double harpoon	9.0	228	21.00	51.0	29.0	12.0	51.0
Two double harpoons..	4.5	513	17.00	97.2	59.3	16.9	59.1

*From Station Bulletin 255, Oregon State Agricultural College, Corvallis, Oregon.

A rebuilt hoist. The hoisting drum is all that is being used. When the control lever is down as shown, the weights apply the brake automatically. When the rope pulls the lever up into mid-position, both the brake and the clutch are released so the drum is free to run for the pullback. Raising the lever to its top position throws the clutch into hoisting position. Single drum hoists with single lever control like this are on the market and are reasonable in price.

with push button control, you can carry the push-button right out to the wagon and start and stop the motor from the load; or if you are ingenious, you can operate your switch from the load with a piece of twine. The rural service man of your power company would be glad to help you with this.

The cost of power for hoisting hay is nothing to worry about. In tests made at a large barn, the power used was only one-third kilowatt-hour per ton. You'd probably have a guilty conscience for not using more.

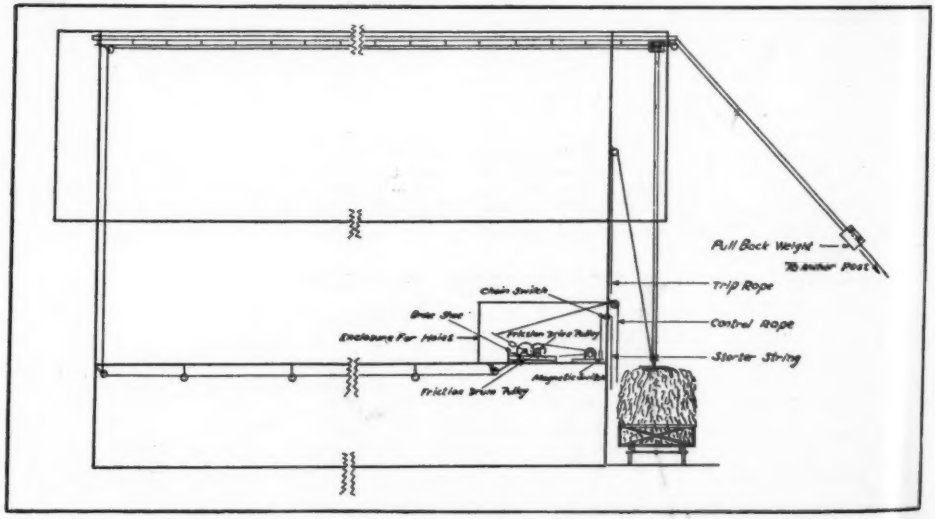
Now for the arrangement. The hoist itself may be placed anywhere in the barn or outside, where it can be anchored to take the hoisting load. The fewer pulleys, the easier the pull. The hoist is used only for lifting the hay. The fork is pulled back by a counter weight. The pull-back rope is attached to the carrier. When the fork is released over the load, it must be heavy enough to come down of its own weight, or weight must be added.

Two methods of arranging weights for the pull-back have been used. In Oregon a heavy wire is attached to the end of the track and to a "dead-man" some distance from the barn. A heavy rock or some old iron is hung from this sloping wire on a pulley, which is fastened to the pull-back rope. At the University of Tennessee where Mr. H. A. Arnold installed a hoist in the new dairy barn, a heavy pull-back weight was attached to a block and tackle inside of the barn just to one side of the hay door, with the rope running through a pulley on the end of the track. By using a heavy weight and pulleys, the vertical travel of the weight was kept within the height of the mow.

In using the hoist, the motor is started; the man on the load gives a slight pull on the control rope and the fork comes down to him. Just before it reaches the load, he releases the control rope and the fork stops. The fork is then swung into place to stick and the control rope given another pull to drop the fork. When ready to hoist, the

(*More on page 26*)

Hoisting and pull-back arrangement at Oregon State College. The hoist was permanently located in the mow. It could have been placed on the ground floor at the front or back of the barn.
Courtesy Oregon State College



PIONEERS

The First Electric Hotbed

By J. C. SCOTT
Agricultural Engineer, Puget Sound Power & Light Co.

INSOFAR as we know, the first attempt at using an electric hotbed was made by Mr. Glen Cushing in 1924. He was then the local manager for the Puget Sound Power and Light Company at Puyallup, Washington. The attempt, I might say, was very successful from the first. Mr. Cushing was propagating a few ornamental plants in a cold frame in the early spring of 1923 when a frost severely damaged these plants. He figured that such losses were unnecessary. Why not apply the same kind of electric heating wire that was used then in the top of all electric ranges, raise the cold frame flats, install the resistance wire in the hotbed underneath the flats, arrange a thermostat to turn the heat on when the temperature in the frame lowered to 50 degrees, and there should be no more losses.

Well, the next year Mr. Cushing had his electrified cold frame ready. To say that it worked satisfactorily is old stuff. But the thing that seems strange now is that Mr. Cushing, even though he was tremendously enthusiastic about the extended use of this arrangement himself, had great difficulty in interesting others.

In 1926 I first met Mr. Cushing in my regular line of duties as the Power Company's farm representative. He said, "I have something I want to show you." And upon seeing this electric hotbed it was easy to visualize electric *controlled* heat taking the place of *uncontrolled* manure heat in hotbeds.

While Mr. Cushing's frame had never been used for propagating garden seeds, yet its value had been demonstrated in propagating ornamental plants. We thought of contacting commercial greenhouse operators and getting them to test this new electric device. Mr. Fred W. Griffith of Puyallup was the first man we contacted and he gave it a very thorough trial.

Cuttings Rooted Successfully

After a year's use he reported that not only did he get a very much higher percentage of cuttings to take root, and develop into sturdier plants than he had ever developed before, but he was able to easily root cuttings such as rhododendrons and blue spruce which has always been considered extremely difficult, even impractical to propagate. He propagated other cuttings in a matter of weeks that theretofore had taken as many months.

Washington State College became interested in giving the electric hotbed idea a trial, with the result that the first college bulletin on a comparison of electric hotbeds with manure heated hotbeds, to be printed in the United States, was published the next year.

It was about the latter part of 1927 that I happened to read a news article about the experience of using electricity for bottom heat in stimulating plants in Norway and Sweden. I immediately contacted the Swedish Consul here in Seattle, who

Mr. Fred W. Griffith, nurseryman at Puyallup, Washington, is using for the first time the electric propagating frame developed by Mr. Glen Cushing.

wrote to the Government Agricultural Department of Sweden and obtained a book describing how a Mr. G. Jacobson had developed an electric hotbed cable, how it was used, and the excellent results obtained in growing garden plants.

At that time there had been no electric hotbed cable manufactured in the United States. We sent to Sweden for our first cable, thermostats, and fixtures sufficient to electrify one-tenth of an acre of ground. This cable was used in experiments in cooperation with the Western Washington Experiment Station at Puyallup, Washington.

Soon after this cable was put in use the electric manufacturing companies in the United States started manufacturing the soil heating cable which is in use today.

I believe it was in 1928 that Mr. G. Jacobson, Agricultural Engineer-in-Chief of Norway, while visiting in the United States, called on us and said he had started experimenting on the electric hotbed in 1924, about the same time that Mr. Cushing was working with his idea. However, neither of these gentlemen was aware of the other's activities until several years later.

Few electric operations on the farm have found a more satisfactory use in helping gardeners and greenhouse operators than has electrically controlled heat in starting and propagating all kinds of plants.

ELECTRICAL HOUSEKEEPING

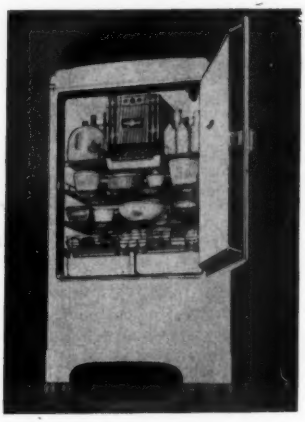
Conducted by GAIL MEREDITH

The Proof of the Pudding

By MRS. A. E. CLAUSER

I WANTED an electric refrigerator very much, but I had to convince my family that it was a necessity instead of a luxury.

"What have we got to put in a refrigerator?"



they asked. "Anything more than milk and butter?"

"No, nothing else," I answered, "because I have to prepare just enough food for one meal at a time."

There was score one,—extra work in food preparation and extra fuel cost.

"But," I went on, "I could plan more appetizing and more healthful meals in hot weather if I had a refrigerator. And besides none of the leftovers would have to be wasted."

"Oh, leftovers. You know we don't like leftovers," they reminded me reproachfully. "If getting a refrigerator means we have to eat leftovers then that's out, definitely out."

But I scored again by telling them that left over food kept under proper conditions did not lose its flavor and could be preserved for several days instead of served for the next meal when they were not hungry for a repeat in menus. That is the real reason they dislike leftovers.

I also explained that all meat broths could be saved and used to season appetizing dishes. This will cut down on meat consumption, I promised them. And in green vegetable time we can store vegetables and enjoy them for several days instead of watching them mature beyond using in the garden.

I told them that our lettuce, cabbage, and radishes would be much crisper and more tender if I put them in the refrigerator over night or several hours before using. I tempted their appetites by mentioning summer salads and deserts that we could have if we had refrigeration.

Then I began keeping a record of all food losses, extra cost of preparation, and I counted the steps to the cellar for one week.

A Record of Food Losses, Cost of Preparation, and Number of Steps Traveled to and from Cellar

Steps to and from cellar stairs	32
Cellar steps up and down	18
Steps in cellar	8
	58
Trips per day	×7
Steps per day	406
	×7
Steps per week	2,842
Loss of food	
Fresh garden vegetables	$1.00
Cooked vegetables	.15
Meat broth and meat scraps	.25
Fresh fruit	.25
Canned fruit	.10
Cooked fresh fruit	.15
Ice purchased for cold drinks	.65
	$2.55

This record will look unreasonable to the average rural reader and home maker but it is all because they do not place a value on their own fresh fruit and vegetable products.

My family likes vegetables only when they are fresh.

I could only guess at extra fuel costs so I did not include them in the record, but since I have had the refrigerator, my fuel cost is one-third less.

I use less cooked foods in the summer time and cook food for several servings with the cost of one. My men enjoy the cold fruit juices during hot weather and are more comfortable because of more healthful hot weather menus.

Planning Ahead Saves Work

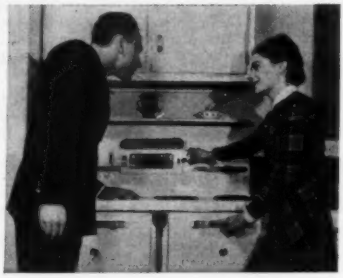
No one realizes as much as I do how much work I save. I plan meals several days ahead. When we have hands or guests, poultry can be dressed, and green vegetables prepared a day before thus avoiding all the rush and hurry. Food is better and I am more agreeable.

We also experienced its value after we killed a beef and a few days of warm weather came along.

Every one is now pleased and satisfied that the electric refrigerator pays for its cost of operation over and over again.

When a Girl Marries

"I DOUBT if he mentioned it when he proposed," Aunt Agnes Netherton put down the dish towel she was hemming and pushed the win-



dow a little higher to let in the soft wind stirring the lilacs outside.

"Mentioned what?" asked Irma Lou poking around in the dish at her elbow for a black jelly bean.

"So far as I can see you've entirely ignored it in all the excitement of being engaged. Showers and parties and parties and showers."

"Ignored what?" Irma Lou popped the last black bean into her mouth and turned toward her aunt.

"And as near as I can remember the marriage ceremony makes no mention of it," Aunt Agnes went on placidly, "but, nevertheless, when a man marries, he gets a life-lease on a cook."

"Oh, that," said Irma Lou somewhat relieved. "Don't think I don't know it. I sort of have it brought to my attention three times a day by mother and the folks, and once a week or so by Tom's mother. I got the idea all right, and I've even taken steps to be one. The most important steps were buying a cook book and a stove."

"Oh, my dear child," moaned Aunt Agnes.

All the girls are getting electric ranges.

"I know what you are going to say. I should be right out in mother's kitchen learning to cook by precept and example. Probably I should, but

IF A WOMAN PLANNED THE KITCHEN

If a woman planned the kitchen, she would do so many interesting things that I was hard put to it to decide which planning to select for you to read. I finally chose a far-western kitchen this time. When Mrs. Bennett begins to translate her plan into wood and nails and cabinets, she will know just what she wants the carpenter to do next, won't she?

* * *

(*Prize Winning Letter for March*)

"And if I could be the woman to plan my kitchen, I would have for my watchword—comfort. For unless everything is arranged for efficiency one can't scarcely find the greatest comfort in working there.

"1—Construction: Have all surfaces smooth, no crevices or edgings to collect dust. Have all doors, drawers, pull-out boards, etc., work easily and arranged conveniently. Practically everything inclosed.

"Plenty of cupboard space and lots of drawers—small drawers, shallow drawers, medium and deep drawers. Sufficient built-in space for hanging all handled utensils, and placed for convenience. In fact I would outline everything I might possibly need a place for in the kitchen, then decide where each thing would be handiest and build my shelves, drawers, cupboards, etc., accordingly.

"2—Arrangement: I would have my stove at the left of the door to the dining room, so my 'cooking unit' would not be separated, except by an outside door. And then following the end wall to the left of stove and around to opposite wall, I would have in the order given, built-ins with tables, sink and drainboard; then built-in with table.

"This arrangement allows for systematic movements, cooking utensils, supplies, sink, work table, refrigerator and stove, all close at hand. Dish washing moves easily, from table at right to sink and on to left, drainboard, then table, then into cupboard right above and at left. At this dish cupboard end of room I would have either a small breakfast table with hinged leaves, or a slide-in table if this can be arranged in the cupboard. If this table is equipped with swivel casters it can be easily rolled wherever desired. It could be used for breakfast for two or three people and could also be used as a serving tray at the dining table.

"And in my kitchen, I want a long mirror so I can see myself as others see me when I am busy. I'm sure it would help me to be more careful about my appearance.

"3—Equipment: Equipment must, of course, be chosen for handy use and to meet all occasions. The stove, refrigerator and all other electrical appliances should be fitted to their places according to their particular uses.

"Yes, I would have my kitchen squeezed into a work shop—but also I would squeeze into my workshop conveniences for comfort in my work."

ELIZABETH R. BENNETT,
R. 8, Spokane, Wash.

I can't leave my job just yet, and besides, we're counting on that money to pay for the stove and refrigerator."

"What kind of a stove did you get? And I do

I get any size fire I need on the top of my range. A big fire to bring food to a boil. A low, low fire to keep it simmering.

hope you children took some one along to help you pick it out."

"Well we didn't," said Irma Lou shortly. "And we got an electric range."

"Electric? With that young wood lot coming along on the south east forty?"

"No wood for cooking for us, Aunt Agnes. Not for cooking. All the girls are getting electric ranges, and for darned good reasons, too. First

A new cook's dream.

of all, they are easy to cook on for dubs like me. And you know Tom's mother is a grand cook. I don't want him to go all pale and listless on me because he doesn't get enough to eat.

"I can read a recipe and follow it accurately, too. Mother says that if I'll use good ingredients and do that, I won't have to worry, for the only thing left is the fire, and the fire in an electric range someone else is watching. I'll know enough to turn a switch, I guess, and I learned how to get any size fire I want, too. The book I got with my range tells all about it."

"An electric range! Well, I declare."

"Yes, a white one with a clock on it, and a jigger they call a minute minder, and a well cooker, and oh, just everything. Mother is so excited about it, she thinks she'll get one, too. Dad says she can have it for a silver wedding present. Sentimental old goofus, isn't he?" Irma Lou's eyes belied the disrespectful scoffing of her words.

"And you really think you can learn to bake in it?"

"Oh, my goodness, yes, Auntie. The thing that makes good baking and roasting such a sure thing is that oven thermostat that keeps the heat where you want it for a hot oven or a slow oven, I just turn the knob on a dial to the temperature I want.

"You can depend on an oven like that because it works automatically. Then of course, I won't mind a bit that these new ranges are just the most beautiful things that I've ever laid my eyes on—and easy to clean! Oh, no, I won't mind that! Nor even the fact that I won't have to cook myself over an old wood stove all summer."

"Well, I will say you seem to know all about these ranges."

"I should. I've been going to cooking schools every week for the last year. I know a lot about the ranges and a lot about using them."

"I never saw such a shut-mouth child," Aunt Agnes, pushed back her glasses and looked at Irma Lou in real surprise. "Here I thought you were just going to work day times and to shows and parties evenings. That's all I ever hear you talk about. Going to cooking school may be the smartest thing you've ever done, Irma Lou. If Tom Patton takes after his father, he will like a good meal of victuals."

"I don't know how smart it was," Irma Lou gave up pretending to hunt for more black jelly beans, and beamed openly at her aunt, "but you'll have to admit, Aunt Agnes, that I did know that when a man marries, he signs up a cook."

• • •

Your Iron

Some Pointers for Use and Care

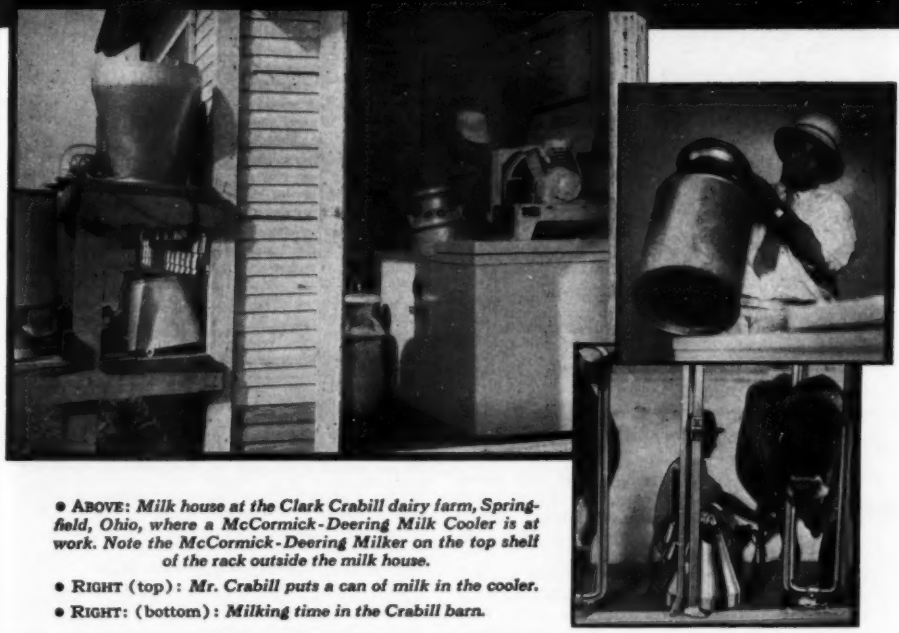
YOUR electric iron needs very little care. If you have had it a long time, it may have no thermostat to control the heat. In that case you have to remember not to leave it connected when you stop ironing to answer the jangle of the telephone or run out into the yard to see what the chickens are squawking about.

Overheating an iron is not good for it. Moreover, an unwatched iron, growing hotter and hotter offers a threat of fire. Of course the thermostat makes it impossible for a modern iron to get too hot. It cuts off the electricity at the right ironing temperatures.

You need to keep the surface of the iron clean. If you burn a little starch on the sole plate, you can scrape it off, very carefully, mind you, with the back of the blade of a knife or with a fine emery

HOT WEATHER AHEAD . . .

Invest in a McCormick-Deering Milk Cooler



• ABOVE: *Milk house at the Clark Crabill dairy farm, Springfield, Ohio, where a McCormick-Deering Milk Cooler is at work. Note the McCormick-Deering Milker on the top shelf of the rack outside the milk house.*

• RIGHT (top): *Mr. Crabill puts a can of milk in the cooler.*

• RIGHT: (bottom): *Milking time in the Crabill barn.*

McCORMICK-DEERING Milk Coolers do a first-rate job the year around, but it is during the hot summer months that dairymen most appreciate their dependable, efficient performance.

Clark Crabill, Springfield, Ohio, is one of many progressive dairymen who find McCormick-Deering Milk Coolers indispensable in keeping down bacteria count. As he explains it, improperly cooled milk causes trouble due to souring, leads to bad flavors, and may possibly become contaminated with contagious disease germs. And that's mighty important today, with health regulations more rigid than ever.

The McCormick-Deering complies with the most exacting cooling standards. *It cools its full rated can capacity below 50 degrees in an hour or less, twice every 24 hours.*

INTERNATIONAL HARVESTER COMPANY
(INCORPORATED)
180 North Michigan Avenue Chicago, Illinois

McCormick-Deering Milkers and Cream Separators are other dairy equipment aids that will pave the way for more profitable dairying and lighten your work as well.

* * *

Here are three good ways to get the facts about McCormick-Deering Dairy Equipment. (1) Ask users in your neighborhood how they like McCormick-Deering Dairy Equipment. (2) Ask the nearest McCormick-Deering dealer for a demonstration. (3) Or, write us for complete information. We sincerely believe you will find McCormick-Deering the best buy in dairy equipment.

McCORMICK-DEERING

Cream Separators · Milkers · Milk Coolers

You need to keep the sole plate clean and smooth.

paper. Just be careful not to scratch the bottom of the iron.

If your iron has an attached cord this won't interest you, but if it hasn't, you may like to know the proper method of connecting the iron. Attach the cord to the convenience outlet first, then connect it to the iron.

When you push the plug onto the pins, push it on straight and make a good connection at once. If you jiggle it back and forth, you may get a little blue spit of flame at the terminals. That is an arc, and an arc pits those terminal pins. Repeated arcing may injure them so they do not make good contact. It may even burn out the heating element of the iron, burn out the cord, or blow a fuse.

After you have finished ironing, take the cord from the iron and then out of the convenience outlet.

A new cordless iron. You can lift it from its stand and use it without a connecting cord. Its manufacturers claim it will maintain plenty of heat.

Summer Salads

Orange Veal Salad Bowl

2 cups cold cubed veal
2 cups orange segments
1 cup sliced celery
1 cup seedless grapes
½ cup toasted almonds
2 tbsp. French dressing

Cut celery and veal in small pieces. Blend with orange segments and French dressing. Let marinate a short time and add to salad bowl lined with greens. Top with toasted almonds.

Chef's Salad Bowl

2 cups orange slices, cut in halves
¼ cup slivers of cooked ham
2 cups mixed salad greens
French dressing made with lemon juice
1 hard cooked egg
1 to 2 oranges for garnish slices
1 bunch radishes

Lightly toss the orange slices, ham, celery and greens together with the dressing, using enough dressing to marinate the greens thoroughly. Garnish top of salad with slices of the egg and whole slices of orange. Shred unpeeled radishes over all.

Cheese Vegetable Salad

6 tbsp. salad oil
2 tsp. lemon juice
½ tsp. salt
¼ tsp. pepper
Paprika and dry mustard
1 tbsp. chopped parsley
1 tbsp. chopped olives for pickles
1 cup cold boiled green beans
½ cup cooked peas
½ cup kidney beans
½ cup cheese, grated

Make salad dressing by mixing oil, lemon juice and seasonings. Add chopped parsley and olives. Mix vegetables and cheese thoroughly and marinate with dressing. Serve on very crisp lettuce.

Cheese and Tomato Salad

Use any mixture of cheese with olives, peppers, nuts or chopped vegetables. Spread this mixture on slices of tomato. Place the tomato slices on lettuce and serve. Or, scoop out part of the inside of the tomatoes, after they are peeled, stuff the tomato with the cheese mixture and arrange around it a tomato peeled and cut into quarters or eights.

JUNE CONTEST

No matter how many silk cloths I save, no matter how many paper dusters I buy, no matter how soothingly the radio beguiles me, I do not like to dust. And I hate worst of all to sit down when the room is clean and finished, sit down to gloat a little with pardonable satisfaction, and have the sun pick out a streak of dust on the back of the feet of the davenport, a streak I left even after I hunkered down and rubbed those feet! Oh, well, we can't have cleanliness and order and beauty without work, can we?

But some parts of the job seem harder than others. What is "The Hardest Job" at your house? That is our contest this month.

If we choose your letter, we will pay you $5.00 at once.

If there are so many interesting letters that we use some of them later, those will bring their writers a dollar.

Send the letters to me, Gail Meredith, at 1026 Seminole Highway, Madison, Wisconsin, by June 20, please.

When you and I were seventeen
It was different on the farm

"Sure, we had running water—but we had to run out to the pump with a pail to get it.

"Blue Monday got its name from the way the womenfolks felt at the end of the day.

"Horsepower—sure, we had that too. But you had to get up at daybreak to feed 'em.

"Now things are different—since the 'high line' went in.

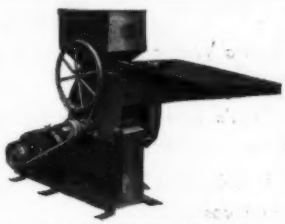
"A Fairbanks-Morse water system puts water under pressure wherever we want it in house and barn. A Fairday electric washer has taken the blues out of washday. Much of the horsepower is supplied by Fairbanks-Morse motors. They drive the drill presses and saws, grind the feed in an F-M Hammer Mill, and man the pumps for irrigation.

"There is just as much work to do on the farm as ever—but it is a lot easier to do it.

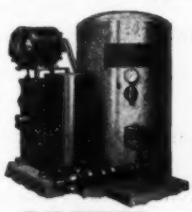
"If you don't know your Fairbanks-Morse dealer—make it a point to get acquainted with him right away. You'll be time and money ahead. Write Fairbanks, Morse & Co., Dept. 658, 600 S. Michigan Ave., Chicago, Ill. for his name."

FAIRDAY WASHERS

F-M WATER SYSTEMS
200 to 5000 gallons per hour



F-M HAMMER MILLS



F-M PUMPS
for all kinds of pumping jobs

When it's even too hot for a Hottentot, COMFORTIZE with an F-M Room Cooler

FAIRBANKS, MORSE & CO.

CHICAGO, ILL.

BRANCHES AND SERVICE STATIONS COVERING EVERY STATE IN THE UNION

WATER
WATER

Every Hour of Every Day

THE day you install an Electric Water System you'll wonder how you ever got along without it!

That's how necessary running water is to every member of the farm family.

It brings to you one of the biggest conveniences in life.

Simply by turning a faucet handle you do away with hours and hours of hard work, and add extra time for recreation and enjoyment.

Be sure your water system is driven by a Century Motor.

Century is always dependable—every hour of every day—proved by the fact that for 35 years thousands of Century Motors have been doing all kinds of hard work wherever there's electricity on the farm.

CENTURY ELECTRIC COMPANY
1806 Pine Street St. Louis, Mo.
Offices and Stock Points in Principal Cities

Century
MOTORS
UP TO 600 H.P.

Hay Hoist Saves Time

(*Here from page* 18)

control rope is pulled down hard and the load goes up. If you want to stop it at any point, just release the control rope and the brake will hold it.

The advantage of an electric hay hoist is not just in the fun if using it, or in saving time. Haying is a time of peak demand for both horses and men on the farm. The hoist saves a man and a horse, and it does not eat anything when it is not being used. The hoist is useful at other times for handling baled straw or sacked grains with slings, or for digging a well. The motor has many uses, not counting lending it to the neighbors.

Water Works for the Farm

(*Here from page* 16)

dwellings or for intermittent service. When buying a pump for year-around service on the farm, however, it would be well to compare actual parts of the small unit with corresponding parts of the large unit, and then judge if the small pump has the stamina for the conditions to be met. Comparing the weights of two competitive pumps, without their motors, will show roughly which pump has the most "guts" in it.

Prospective purchasers will do well to be guided by the advice of a dealer who has been in the business of selling and installing pumps for a number of years and who can point to a record of a large number of satisfactory installations. After all, nobody knows pumps like the man who has made it his business to sell and install them.

The right pump, correctly installed, will give years of trouble-free service. The initial cost should always be considered from the long-term point of view.

Other men's faults are before our eyes; our own behind our backs.—*Seneca.*

* * *

What is shown by example, men think they may justly do.—*Cicero.*

Courtesy Rockefeller Center Weekly

How can you tell which is Grade A or Grade B milk?

Editor's Chat

(*Here from page* 4)

agents to 125,000 farm families. That is pretty good work by the states considering that they got very little encouragement from the Department.

Now it happens that I have worked for these different agencies and I know what they have done and what they have not done. The Department has furnished a small part of the money used for these state activities, not by direction of the Department, but because of the semi-autonomous existence of the state experiment stations and extension services. Oh yes, and the Department itself "has issued four rural electrification reference lists." I almost forgot that.

Here's what I think the Department deserves credit for: They own a big field. Some farm folks, the power companies, the C.R.E.A. and the R.E.A. get anxious over the weeds. They slip in, do a little plowing, scatter some seeds, throw some fertilizer over the fence, and in due course they have nice, sweet watermelons. Then one day the Department happens down in that southwest forty, and Behold! there's watermelons on *their* land. They issue a report.

With all that states and other agencies have done, it is only a beginning. Few county and home agents can do more about rural electrification than to help in the promotion of lines. Much of the research work is a duplication of what has been done elsewhere because the researcher does not know it has been done, or wants to see for himself. The educational and research program needs direction; it needs official stimulus and approval.

The last Department letter says: "The Department's viewpoint is very much in line with your suggestions—" I hope so. I suggested action. The Department says it needs money. Perhaps so. What is needed first is a proper conception of the job, and a program full of ginger. There are two parts to rural electrification: Line and load building—making the investment yield profits. That's a job for the power companies and R.E.A. But *farm and home building*—making better products and more profits with the aid of electricity; that's the important one and is primarily an agricultural job.

Are we approaching dawn?

GEO. W. KABLE

The agricultural population produces the bravest men, the most valiant soldiers and a class of citizens the least given of all to evil designs.—*Cato.*

* * *

A man does not wonder at what he sees frequently, even though he be ignorant of the cause. If anything happens which he has never seen before, he calls it a prodigy.—*Cicero.*

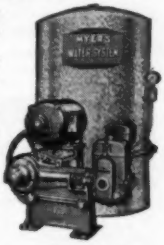
* * *

Electricity—carrier of light and power, devourer of time and space, bearer of human speech over land and sea, greatest servant of man, itself unknown.—*Charles W. Eliot.*

* * *

"Pieces of eight," famed coins of early pirate chests, were Spanish silver dollars. They were sometimes cut diagonally into eight pieces for use as change. Each piece was called a "bit." Two-bits was a quarter of a dollar; four bits a half-dollar.

NO one appreciates more than the youngsters do, the comfort, convenience and sanitary protection afforded by a reliable MYERS Water System. And years later, after they have grown up, they will appreciate just as much the wonderful durability and remarkably low operating cost of that same MYERS. Your children's children may well enjoy the MYERS Water System that you install now. Deep well and shallow well models to meet all needs; for operation by electricity, gasoline engine, windmill or hand power.



No Need to Wait for Electricity

Until the power line reaches you, enjoy running water with a MYERS Gasoline Powered System, which can later be converted to completely automatic electric operation by simply mounting an electric motor in place of the engine. Write us or ask your dealer.

MYERS
WATER SYSTEMS

THE F. E. MYERS & BRO. CO.

1126 Fourth Street, Ashland, Ohio

Send free information on items marked and name of your nearest dealer.

Water Systems (electric)	☐	Sump Pumps	☐
Water Systems (gasoline)	☐	Centrifugal Pumps	☐
Power Pumps	☐	Hand Sprayers	☐
Hand Pumps	☐	Power Sprayers	☐
Pump Jacks	☐	Hay Unloading Tools	☐
		Door Hangers	☐

Name .....

Address ..... (WS 8-25)

Take Off Your Hat to the MYERS

MODERN FARM LIGHTING

BENJAMIN
YARD LIGHT

Light your farm yards and you'll get the rush work done on time!

Here's an inexpensive Yard light for your farm that will make you wonder how you ever got along without it! Manufactured by Benjamin, world leader in lighting equipment, this reflector is made of lifetime porcelain enameled steel. Easy to keep clean. Comes packaged ready for installation. Nothing else to buy. Package contains reflector, socket, conduit arm, wall fitting, bolts and 2 ft. wire leads.

SEE YOUR ELECTRICAL STORE OR WRITE THE BENJAMIN ELECTRIC MFG. CO. DES PLAINES, ILL.

BENJAMIN
VARIETY-LITE

NEW LOW COST PORTABLE FLOODLIGHT FOR FARM FUN on the farm! Think of how your family and friends will enjoy a yard floodlighted for night sports, night parties, etc. Provides protection against prowlers, too! Use it for night work. Take it from one location to another. A quality product made of lifetime porcelain enameled steel. Complete with unbreakable plug and extension cord . . . efficient—low priced.

BENJAMIN LIGHTING EQUIPMENT
Distributed Exclusively Through Electrical Wholesalers

Lowest Prices!
FORDS
MILKERS

¼ H. P. GE MOTOR OR BRIGGS-STRATTON GAS ENGINE

PORTABLE OR TRACK MODELS

Most economical . . simple . . sturdy . . fewest parts . . cleans itself automatically. Thousands of satisfied users. Fully guaranteed. Write for catalog, low prices and easy terms.

MYERS-SHERMAN CO.
Dept. F STREATOR, Illinois

CHURN WITHOUT TURNING A HAND!

GET MORE BUTTER *FASTER EASIER* WITH DAZEY ELECTRIC

● All the features that have made DAZEY hand churn famous for generations made still more efficient by POWER. Unbelievable savings of time and labor. Priced remarkably low. Sold wherever there are rural power lines, Write us for particulars.

DAZEY CHURN & MFG. CO., Dept. H-183, St. Louis, Mo

DAZEY ELECTRIC CHURNS

ON THE AIR

Conducted by JEROME J. HENRY

Benny Makes Comics of Cast

IT matters not to Jack Benny whether you are a singer, conductor, or announcer. If you're on his program sooner or later you will be written into the show as some kind of comic.

This at any rate has been the case as far as Kenny Baker, Phil Harris, Don Wilson, and the rest of the cast is concerned. Each was originally hired to do a job of singing, conducting, announcing or something specifically not in the laugh department. And before anyone was aware of what he was doing, he was feeding Jack comedy lines as if he'd been brought up on Weber and Fields.

And Jack hasn't stopped with equipping those on his regular microphone roster with punch-line material. Harry Baldwin, the young man who knocks at the door and says in a questioning voice, "Mr. Benny?" joined the comedian many years

The Maxwell that isn't a Maxwell but sounds like a Maxwell over the air during Jack Benny's broadcast.

ago as his personal business aide, and as such he continues except for those moments when he becomes an actor.

The first actress to join the program for her ability to read comedy lines was Blanche Stewart, an old friend of Jack's, and Mary Livingstone's from the vaudeville days.

Ed Beloin and Bill Morrow, Jack's regular gag writers, don't stop like most writers at getting their laughs down on paper. Few weeks will pass when they will not be asked to juggle a baker's dozen or so of their own lines on the air.

• • •

Performers Make Friendly Calls on Kemp

NEIGHBORLINESS is the keynote of the "Time to Shine" program over the Columbia

network on Tuesday evenings. Radio stars heard on neighboring Tuesday evening shows have dropped in on Hal Kemp and his orchestra to welcome the new group on the air. The friendly gesture was so well received by listeners that it is being continued in the series.

On the inaugural program Benny Goodman, the "King of Swing," who just precedes Kemp on the air, ran down after his broadcast to bid him welcome. Al Pearce, who is heard an hour earlier than the "Time to Shine" program, dropped in and presented one of his famous "I hope, I hope, I hope" routines.

Now Tuesday night on the air reminds one of a typical small community where everyone comes to call on the family who has just moved in. The program itself is an informal period of music and song. The unceremonious visits of radio stars fit in perfectly with its tempo. Hal Kemp, with true southern hospitality, welcomes his callers by turning the spotlight and microphone over to them and giving them as much time as they want to talk or do a "turn."

• • •

Travels Far But Pays No Fare

BY THE time Betty Lou Berry has been on the radio six months she will have traveled 10,000 miles without paying a cent of steamship, rail, or airplane fare—without walking a step or hiring a taxicab.

Since Betty Lou has only a rather ethereal existence in the throat of Tommy Riggs, she gets by without a ticket but does plenty of traveling about just the same.

To begin with, last August she transferred her activities from Cincinnati to New York and went on the Rudy Vallee program. In October when Rudy went to Hollywood she went along. Now Rudy has been back in New York.

Betty thinks broadcasting with Rudy is a whole "bunch of fun."

• • •

Starlines

BEVERLY is a pert young songstress heard over CBS. She was born in Oklahoma. Her girlhood ambition was to marry Bing Crosby; he's still her favorite artist.

Beverly had special music instruction for 15 years and made her radio debut three years ago in Tulsa in a trio with her sister Judy and Helen Jackson. In 1934 she went to New York on a vacation, but instead of going back to Oklahoma she landed a network radio job.

Last year she married Carl Mahr, a song arranger. Beverly hates people who talk about themselves and their accomplishments. She has never had enough of good music, clothes and travel. Usually she wears green because it matches her eyes and looks well with her red hair.

KING CAROL of Rumania is the only crowned head in Europe who is in the grocery business. His vineyards, dairies and orchards supply him with the finest wines, cheese, butter and fruits in such quantities that a shop has been fitted up inside the back door of his palace where the surplus is retailed at reasonable prices to the public.—*N. Y. Times.*

Westco Storage Tank System. Tanks can be furnished in sizes from 12 to 530 gals. capacity and larger.

LET WESTCO DO IT!

The Original Turbine Type Pump

We recommend the installation of a Westco automatic electric water system as one of the most important improvements for your farm. You will be more than repaid by the comfort and convenience this will offer you. Westco, the originators of the Turbine Type Pump, offer you a unit that will give you the very best of service, trouble-free operation and water everywhere you want it. Westco systems are entirely automatic, quiet in operation. The pumping unit is equipped with only one moving part, the impeller, which rotates without metal-to-metal contact in the pump casings, and bronze removable liners, which resist rust and are your protection against wear and corrosion. So write today for a free colorful catalog on Westco systems which are guaranteed to give you absolute satisfaction or your money cheerfully refunded.

MICRO-WESTCO, INC.
BETTENDORF IOWA
NEW YORK - CHICAGO - PHILADELPHIA
BOSTON - SAN FRANCISCO - LOS ANGELES

Free Information About Equipment

Readers—we are glad to help you secure catalogs and descriptive literature on electrical appliances and equipment. It is a FREE service and NO OBLIGATION is involved.

When seeking information about any piece of equipment or material you are planning to buy, first look through the advertisements in this issue. They are your best guide.

Then, if you do not find what you want—use the handy coupon below, listing clearly and exactly the items on which you want further information.

___Animal Clippers	___Milk Coolers
___Bench Saws	___Milking Machines
___Better Sight Lamps	___Motors
___Bottle Washers	___Paint Sprayers
___Brooders	___Pasteurizers
___Bunch Tyers	___Radios
___Burglar Alarms	___Ranges
___Churns	___Range Heating Units
___Clocks	___Refrigerators
___Clothes Washers	___Roasters
___Coffee Makers	___Septic Tanks
___Corn Shellers	___Sewing Machines
___Cream Separators	___Soil Heating
___Dairy Sterilizers	___Soldering Irons
___Dishwashers	___Spray Plants
___Drills	___Toasters
___Egg Graders	___Threshing Machines
___Ensilage Cutters	___Time Switches
___Feed Grinders	___Tool Grinders
___Feed Mixers	___Ultraviolet Light
___Flat Irons	___Vacuum Cleaners
___Floodlights	___Vegetable Washers
___Food Mixers	___Ventilators
___Hay Choppers	___Waffle Irons
___Hay Hoists	___Water Heaters
___Ice Cream Freezers	___Water Softeners
___Incubators	___Water Supply
___Insect Killers	___Welders
___Ironing Machines	___Woodworkers
___Irrigation Equipment	___Yard Lights
___Light for Plant Growth	

FREE INFORMATION COUPON

ELECTRICITY ON THE FARM
Readers' Service Dept., 24 W. 40th St., New York

Without cost to me, please have manufacturers send complete information on the following Electrically Operated Equipment which I am thinking of buying:

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My name is .....

Address .....

I get electricity from .....

..... 6-38

Questions and Answers

Water Heater for Washing Machine

Question: *I would appreciate your giving me some advice about the electric poultry water heater mentioned on page 34 of your January, 1938 issue, as to price. I am wondering if I could possibly use it to heat water in my electric washing machine.*
L. S. W.

Answer: The electric poultry water warmer shown on page 34 of our January issue would not be suitable for heating water for washing. It only has a very small heating element designed to keep two or three gallons of water from freezing. The heating unit shown on page 30 of our February issue would be reasonably satisfactory for this purpose. This heater would warm about six gallons of water from 65 degrees to 100 degrees in one hour's time. The unit is made by the Edwin L. Wiegand Co., Pittsburgh, Pa.,

Increasing a Water Supply

Question: *In our house we get the water from a spring which comes down to the house by gravity. The spring is located about 400 feet from the house. The water only reaches the first story and we do not get enough of it. We wish to erect a pump to drive the water to the second story. Would it do to simply attach the pump to the pipes leading from the spring, or should we also erect a tank in addition to the pressure tank so that the pump would be protected?* E. B.

Answer: Just attach your shallow well pump to the pipe from the spring. You will not need an elevated tank.

If the pipe from the spring is smaller than 1-inch in diameter you may be disappointed in your water supply even though you connect a small pump to it. The average small water system delivers about 250 gallons per hour. With this amount of water flowing through a ¾-inch pipe, for instance, your loss of head due to friction, as explained on page 27 of our March issue, would be equal to about 35 feet. In other words, this friction would be equivalent to lifting water 35 feet from a well.

If you are using a ¾-inch pipe or smaller the supply can be improved by using a larger pipe or by building a concrete cistern at the house which can be filled by water from the spring flowing through the small pipe. Your water system would then be placed so as to draw water from the cistern.

A Deep Well Problem

Question: *Your article in* ELECTRICITY ON THE FARM *interested me much. 16 years ago my 146 ft. well was drilled and until about 6 years ago the water came up in the 4½" casing, three ft. above the basement floor so I put in a used 720 gal. per hour shallow well pump and could irrigate the garden all night and the water level in the well would not drop at all. Now for the last*

5 or more years the water level drops so low that after a couple hours running the pump will not draw water. I can't decide what type or make of deep well pump to get because it must handle 600 g.p.h. or more. It will be in the basement where the 220 gal. pressure tank is now. Can you help?
S. W. G.

Answer: One or two things may be happening to your deep well water supply. The bottom of the well may be gradually filling with sand or the well screen becoming clogged which restricts the flow of water; or the supply may be running low. If the well is filling, it can probably be cleaned out with a sand bucket. If the screens are clogged, well drillers would probably be able to cut new openings in the casing for you. I suggest you consult your well driller first.

If you use a deep well pump it will be necessary to place the pump head over the well. If your well is in the basement your piping and rods for the deep well cylinder will have to be installed in short sections. Any of the manufacturers advertising in ELECTRICITY ON THE FARM can supply equipment to answer your needs.

Heating Element for Oven

Question: *I am planning a well-insulated oven for melting large cans of honey for bottling. The oven will be about 24" × 18" × 48" inside, and the temperature of the air is to be kept at 160° for 4 and 5 hours to melt up each batch.*

(1). *How large an element (or elements) would be required to maintain that heat?*

(2). *Could the screw-type elements, such as are used in bathroom heaters be used in several sockets in the oven?*

(3). *Would there be any advantage in using 220 volts instead of 110?*

(4). *Could a double-wafer type thermostat be used to snap on and off the controlling switch at as high a temperature as 160°?* McC. D. J.

Answer: (1). Assuming the amount of honey to be 300 pounds and the time to raise it from 50° to 160° to be four hours; and with an oven insulated with two inches thickness of rock wool, you would need 4 kilowatts in the heating element.

(2). The best type of heaters to use would be strip or space heaters which are about 1-¼ inches wide and of most any length desired and with the heating element enclosed in a metal housing. Those elements have holes in the end for bolting to metal supports.

(3). For a load of this size you should use a 220 volt circuit.

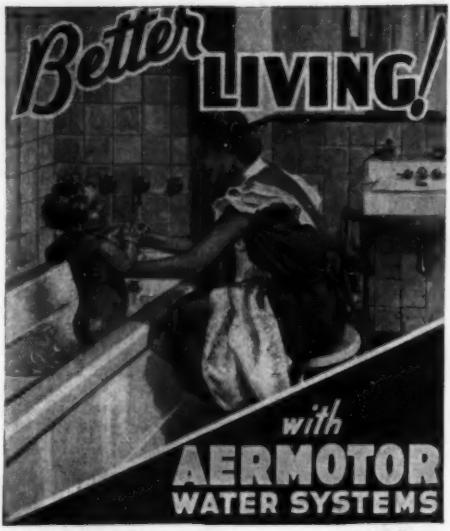
(4). A wafer thermostat would not be suitable for controlling the temperature unless it was especially made for this purpose. Thermostats made for use in incubators and brooders would be ruptured by the temperature of 160° Thermostats similar to those used for soil heating installations, but designed especially for temperatures around 160° would be satisfactory. Such thermostats are made by the General Electric Company or the Penn Electric Switch Company of Des Moines, Ia.

The Dogs Higher Up

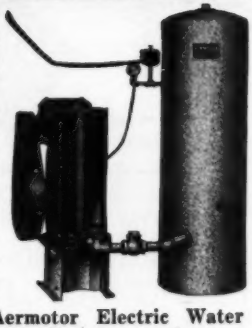
"So you're a young man with both feet on the ground, eh? What do you do for a living?"

"I take orders from a man with both feet on the desk."

—I'm proud I am a Farmer—



When you think in terms of your family's comfort—of your own personal comfort, you will realize the importance of ***running water.*** Besides, running water lightens household duties and leaves many extra minutes to spend every day as you wish.



Enjoy these ***better living*** conditions to the fullest with the installation of an **Aermotor Electric Water System.** It is as modern as today, and with ***more*** exclusive features than you ever expected to find in a water system.

Compare an **Aermotor** point by point with any automatic system. You will find that ***only*** **Aermotor** offers you ***so much.*** Notice the quality and the extra value that is apparent everywhere. Still, with all these advantages, these outfits are offered at traditionally low **Aermotor** prices.

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AERMOTOR COMPANY,
2500 Roosevelt Road, E-3
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I am interested in an **Aermotor Water System.** Send "Facts" Book.

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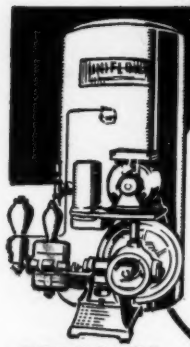
Address .....

Town..... State.....



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A Complete Line

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Shallow Well Systems from $55.00 up
Deep Well Pumps from $89.00 up
Deep Well Systems from $104 up
Models from 250 gal. to 5000 gals. per hour.

Uniflow Shallow Well System P253—265 G.P.H.—42 Gal. Tank—$75.00

Uniflow was one of the first to build electric pumps—thousands are in rural service. They are approved for F.H.A. financing. Write for our new pump catalog and for address of nearest Uniflow dealer.

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Hot Water 24 Hours a Day — Cheap, Clean and Efficient—No Odors, Smoke or Fumes — Fire Hazard Eliminated. Heaters Tested Under Actual Use on the Dairy Farm Are Absolute Proof That the Losee Is Extremely Economical.

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SECTIONAL VIEW OF POWER UNIT WITHOUT GUARDS

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In a husky, hardwood frame of bolted construction. Powered with ¼-h.p., 110-volt motor with combination chain and gear drive . . . all moving parts, except stone, fully enclosed in metal case. All bearings protected against water. Write for full description and price. Agents wanted — good profits.

S. RALPH CROSS
9 May Street - Worcester, Mass.

Reviewed by T. E. HIENTON

Names and addresses of manufacturers of the articles described in this column will gladly be furnished upon request to What's New Department, ELECTRICITY ON THE FARM, *24 West 40th Street, New York, N. Y.*

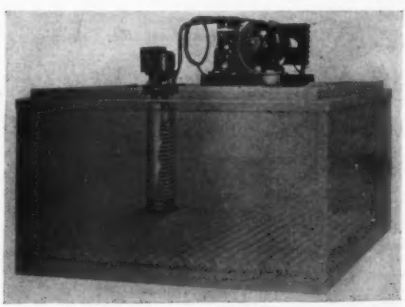
Electric Water Heater

Many demands are made for hot water in the farm or rural home which are never experienced in the city home. Hot water is needed to wash the cream separator, to mix with the skimmilk to make a warm drink for the calves or to scald a chicken. A 1½-gallon electric water heater to be hung over the kitchen sink is a new product of an eastern manufacturer of water heaters. The heating element is rated at 1400 watts for use on a 115-volt circuit and is thermostatically controlled. The necessary fittings and a rubber hose are provided for connection to the cold water piping.

Milk Cooling Unit

A new "drop-in" milk cooling unit which can be installed in any standard type of milk cooling tank has just been announced by one of the old, established manufacturers of farm and domestic refrigerators. The new unit consists of a cooling coil and motor driven water circulating device

(*More on page* 34)



Believe It or Not

(*Here from page 9*)

heads, switches, pump, motor, wiring, and private power line was $1050. He uses a 5 h.p. motor and pumps 120 gallons per minute against a total lift of 100 feet. Mr. Wyss irrigates 32 acres, 22 of which are in permanent native pasture and 10 acres in grass and clover hay sufficient for his needs. In 1936-37 he pastured 33 head of dairy cows on the same irrigated pasture required for 28 head before irrigation in 1934-35. In 1936-37 he produced 21,258 pounds of butter fat with 33 cows (664 pounds per cow) and in 1934-35, 16,370 pounds with 28 cows (548 pounds per cow). This gave a gross increase of 4,888 pounds at 48c per pound (the average price for 1936-37) or $2,346.24, which represented his increased gross earnings, with an irrigation equipment investment of $1,050. The operating cost for electricity was $109.42 for the four months period in 1936 and $92.90 for three months in 1937. This was $3.40 per acre per season in 1936 and $2.90 in 1937.

Another factor of considerable importance was fertilizing. Mr. Wyss has a liquid manure pit and has utilized all liquid manure produced on his pastures both before they were irrigated and since. With fertile soil, water was the limiting factor and the combination has given excellent results.

In terms of butterfat, savings of approximately 10c to 12c per pound are being made with irrigated pasture over other feeding methods.

Belt Drive; Lagging Pulleys

(*Here from page 11*)

to rivet the material down, the water glass itself forming a sufficiently firm bond for the purpose. Canvas should be cut smoothly to the width of the pulley face so that there will be no whipping cords to start tearing. Moisten a few inches of the canvas strip with water glass and paste it to the pulley. Allow this time enough to set so that you will not be troubled with slipping while wrapping the first few turns around the pulley. Block the pulley so that it will not turn easily. Then saturate about two feet of the canvas at a time. Work it down with the hands so as to preserve the normal crown of the pulley. The crown is necessary to make the belt operate properly. The canvas should be wrapped on snugly.

The canvas should be wrapped around the pulley so that the pull of the belt will tend to wrap the canvas tighter. Let the water glass harden 24 hours before use and the edge will not be torn loose.

Many of these pulleys have been in service for several years and have stood considerable abuse.

UP TO HUNDREDS OF GALLONS OF RUNNING WATER PER HOUR

with a

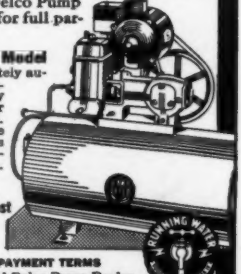
DELCO PUMP

Saves Money—Time—Work!

● Water for washing, baths, dishes—by turning a tap! Water for horses, cows, chickens—for hotbeds and garden—without carrying it from the pump! Enjoy the convenience of water on tap *—under pressure—*all year round. Up to hundreds of gallons per hour available.

COST LOWER THIS YEAR!

Running water now costs only *a fraction of a cent* a gallon. You can *earn* enough and *save* enough to pay for a Delco Pump—*and make a profit besides!* There's a size to fit your needs... Delco Pumps are available in deep or shallow well models—110 volt or 32 volt. See your local Delco Pump dealer now for full particulars.



Delco Pump Model C-12—Completely automatic operation — capacity 225 gallons per hour — 12-gal. tank for storage purpose. This model for shallow well service.

Low Price

Low Operating Cost

Long Life

EASY PAYMENT TERMS

Ask your local Delco Pump Dealer.

UNITED MOTORS SERVICE INC.

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RAINMAKER

PREVENTS PARCHED PURSES

Make rain while the sun shines! Timely planting, healthy germination and full maturity assured by Calco Portable RAINMAKER. Water from well, ditch or stream put where you need it when you need it. Quickly connected and easily moved, it brings freedom from weather worries to large or small farms. Frequently pays for itself the first year. Get the whole story!

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Send me the RAINMAKER story.

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Address _____

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What's New

(*Here from page 32*)

enclosed in a cylindrical steel shell and connected to a standard compressor unit. It is shipped from the factory ready to be installed in the cooling tank and plugged into the electric circuit. Temperature control is automatic. Units are made in two sizes for cooling 2 and 6 cans of milk per day.

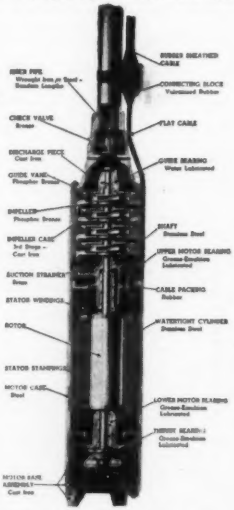
New Combination Milk and Food Cooler

A wet storage cooler for cans of milk with a dry storage compartment for foods is the latest thing in coolers announced by one of the large

manufacturers. The cooler is made in 2, 4, 6, and 8 can sizes. The one shown is a 4 can combination. The cooling tank is surrounded by cooling coils and has a pneumatic water agitator.

Deep Well Centrifugal Pumps

Priming the pump on a cold winter morning with a teakettleful of hot water is a familiar scene or a vivid recollection to a majority of farmers and their families. Modern water pumping equipment and improved installations have made this task an easy one to forgo. Electric motors have aided in making such equipment automatic, practically eliminating the necessity for any attention.



Distribution of a deep-well centrifugal pump, which has been used in foreign countries for more than a decade, will be made in this country by a Michigan pump manufacturer. A unique feature of this pump is that the motor is submersible and actually operates beneath the surface of the water in the well. The motor and pump to which it is directly connected are attached to the lower end of the riser pipe. Pressure tank and motor control equipment may be located in any convenient location such as the basement of a house. Sizes vary widely from as low as 300 to as high as 50,000 gallons per hour.

Household Refrigeration

Frozen foods require lower temperatures than are usually provided in the storage compartment of the household electric refrigerator. The farm housewife, who may store a quantity of frozen meat and vegetables in a storage locker, will be interested in a new household refrigerator which provides a compartment for frozen storage as well as another for the usual storage. This new refrigerator is available from a Middle Western manufacturer in three sizes. These have total storage space equivalent to approximately 11, 9½ and 7½ cubic feet respectively. Temperatures of 12 to 15 degrees below freezing are maintained in the frozen storage compartment according to the manufacturer.

CLASSIFIED ADVERTISING

FREE CATALOG of largest all-electric poultry equipment line. Brooders, ELECTRIC FLY & INSECT KILLERS, supplies for home-made equipment, heaters, thermostats, ventilators, burglar and fire alarms. Prompt delivery. Advisory service without obligation. Write today to LYON RURAL ELECTRIC COMPANY, Dept. EF, San Diego, California.

WRITE FOR FREE COPY of Bussey's Book for Poultrymen. Low prices on parts for electric brooders and batteries. Complete heating assembly—factory price only $2.45. BUSSEY PEN PRODUCTS COMPANY, 5151 West 65th Street, Chicago, Illinois.

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